REMEDIAL ACTION REPORT
FINAL TREATMENT/DISPOSAL OF LOVE CANAL SEWER AND CREEK SEDIMENTS AND OTHER REMEDIAL WASTES
LOVE CANAL SUPERFUND SITE
NIAGARA FALLS, NEW YORK
MARCH 2000

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1.0 EXECUTIVE SUMMARY

In accordance with the Partial Consent Decree entered September 20, 1989 in *United States of America, et al. v. Occidental Chemical Corporation, et al. CA 79-990 (JTC)* as modified (Love Canal Landfill Partial Consent Decree) (LCPCD), and the Site-Specific Treatment Variance approved by USEPA on December 14, 1998 (Variance), all associated Love Canal Remedial Wastes have been properly shipped and disposed of in permitted Treatment, Storage, and Disposal Facilities (TSDF). The disposal shipments commenced on August 19, 1996, and were completed on August 10, 1999. The disposal activities included the shipments of rolloffs and bagged materials. Rolloffs containing debris were shipped to Subtitle C landfills for disposal. Rolloffs containing other remedial wastes were shipped to incinerators for treatment prior to disposal. All bagged materials were transported and disposed of in accordance with the "Sampling and Analysis Plan, Love Canal Wastes" (SAP), dated June 3, 1996, the Phase I and Phase II sampling and analysis reports, and the Variance. Incineration/disposal of the shipments was completed by October 30, 1999.

A statement certifying the completion of the Remedial Wastes disposal in accordance with Paragraph 39 of the LCPCD is provided in Section 10.0. A copy of all associated manifests and certificates of disposal have been sent under separate cover to Damian Duda, Love Canal Site Project Manager for the United States Environmental Protection Agency (USEPA).

2.0 INTRODUCTION

This document certifies the completion of disposal of wastes generated from the clean out of the sewers and creeks and other remedial wastes associated with the Love Canal remedial activities, as defined in the LCPCD. The Love Canal remedial wastes consist primarily of contaminated creek sediments, as well as contaminated storm and sanitary sewer sediments. The remediation of these wastes was specified in EPA's September 1985 and October 1987 Records of Decision (RODs). This remedial action of the Love Canal wastes has been identified as Operable Unit Five (OU-5). The primary contaminant of concern with respect to the completion of OU-5 is dioxin; the Love Canal remedial wastes can also be labeled as dioxin-contaminated sediments. The materials were generated during activities associated with remedial activities at the Love Canal Landfill Site (Site) in Niagara Falls, New York. As part of the LCPCD, sediments and debris from the surrounding Black and Burgholtz Creeks were excavated and staged at the Site. The materials were processed, dewatered, and bagged at the Site near the

93rd Street School. Larger materials were placed into rolloffs and stored at the Site. Some rolloffs and all bagged material were transported to permitted storage facilities at Occidental Chemical Corporation's (OCC) Buffalo Avenue Plant (Plant) in Niagara Falls, New York.

Disposal methods were stipulated in the LCPCD. These activities were subsequently amended by the Second Modification to the LCPCD, entered January 15, 1997, and the Variance. Sampling and analysis activities to support the disposal decisions were performed as specified in the SAP. Information detailing the sampling and analysis activities can be found in the Phase I and Phase II reports, provided to the USEPA, dated February 26, 1998 and June 30, 1998, respectively.

Rollins Environmental Services (Rollins) was originally selected by OCC as the disposal firm. In May 1997, Rollins merged with Laidlaw Environmental Services (Laidlaw), using the Laidlaw Environmental Services, Inc. corporate title. Laidlaw subsequently merged with Safety-Kleen Corporation in September 1998, using the Safety-Kleen corporate title. All disposal facilities used were originally either Rollins or Laidlaw TSDFs. References to the facilities in the following text will use the facility name and the company name in use when the activity took place. It should be noted that in general the same facilities were used throughout the project, only the owner's name changed.

All rolloffs were transported from the Plant to the TSDF using trucks provided by Hazmat Environmental Group, Inc. of Buffalo, New York. All bagged materials were transported from the Plant to the TSDF by railroad.

The activities summarized in Section 1.0 and documented throughout this report represent the completion of the operable unit (OU-5). All remedial wastes generated have been properly treated and disposed. No operation and maintenance is required for this remedial action.

This report discusses the disposal activities, sampling, and analysis required for the completion of the project.

3.0 OPERABLE UNIT BACKGROUND

The LCPCD required OCC to process and bag the excavated sediments and other Remedial Wastes, and then transport the materials to permitted centralized storage facilities at the Buffalo Avenue Plant. The LCPCD called for the thermal destruction of Love Canal remedial wastes. Dioxin was the main contaminant of concern in the materials. OCC was further obligated to use its best efforts to obtain a permit to incinerate the waste materials in a TDU to be built at the Plant.

OCC bagged the sediment, carbon, debris, and facility cleanup materials from August 1989 to July 1990. The sediments included materials from both the creeks and the sewers. The dredged sediments were placed in a holding basin to dewater the material, thus reducing the water content. A filter press was used to further dewater the material. The sediments were blended with clay, and further treated by the addition of powdered quicklime to a pH of 12 to 14. The addition of the lime reacted with soil/sediment and any moisture present to stabilize constituents that may have been present, thereby reducing the potential for the constituents to leach from the media. The lime also served to further remove any free moisture still present in the material. The material was placed in double-lined synthetic plastic bags. The bags were lined with polyethylene inside and polypropylene outside and had a capacity of 6,000 pounds. The bags were roughly five feet wide when full, and could be stacked with a forklift. The bagged materials and some rolloffs containing debris and other materials not amenable to the bagging process were transported to the Plant. The rolloffs were staged on concrete pads at the OCC Buffalo Avenue Plant, while the bags were housed in centralized storage units T-28 and T-29 at the Plant. The storage of the bags in the centralized storage units (as waste piles) was approved by USEPA and the New York State Department of Environmental Conservation (NYSDEC) in modifications of the OCC Buffalo Avenue Plant RCRA and NY Part 373 permits in August 1989. Storage in excess of 90 days was approved in 1993 by New York State in an amendment to the Consent Decree for performance of the Supplemental Data Collection Program at the Buffalo Avenue Plant. Some rolloffs remained staged on concrete pads at the OCC Love Canal Site.

Subsequent to the entry of the LCPCD in 1989, the utilization of existing commercial incineration capacity outside the City of Niagara Falls became a viable cost-effective alternative for OCC. The consideration of commercial alternatives to the on-site TDU was also responsive to public concern about the construction and permitting of new hazardous waste incinerators within Niagara Falls. In addition, in 1990 the USEPA promulgated regulations that affected the classification of the waste materials under the RCRA program.

Prior to 1990, the Love Canal Remedial Wastes were classified as an F020 RCRA-listed waste. This classification, together with corresponding provisions of the LCPCD, required incineration of the materials with a destruction removal efficiency of 99.9999%, regardless of the level of contamination present in the waste. The 1990 regulations created a new hazardous waste category, F039, which was applicable to leachate from multiple wastes, the environmental media containing such leachate, and residuals derived from the management of this leachate. The Remedial Wastes were reclassified under the F039 waste code. This waste code allowed for land disposal in a RCRA Subtitle C landfill if all applicable land disposal restriction (LDR) regulations were met. Based on the above developments, the USEPA issued an "Explanation of Significant Differences" in 1996 to the 1987 ROD, documenting that it was no longer necessary to thermally treat all the Remedial Wastes.

In 1997, the Second Modification of the LCPCD allowed the thermal treatment of the materials to be conducted at commercial facilities instead of the Plant. Remedial Wastes

could be segregated based on the F039 LDR requirements. Materials with concentrations of contaminants below the LDRs could be directly landfilled in a Subtitle C permitted facility, while materials with concentrations greater than the LDRs required thermal treatment prior to landfill. In 1998, the USEPA approved OCC's petition for a Site-specific Variance. The Variance allowed OCC to landfill certain bagged Remedial Wastes containing up to 10 times the LDR limit for regulated dioxins and furans, provided that no other regulated chemicals exceeded the F039 LDR limits.

OCC petitioned for the Variance based on several factors. The specified bagged Remedial Wastes had already been treated and were in double-lined plastic sacks. The Remedial Wastes were also significantly different than the process wastes for which the LDRs were developed. Incineration of the specified bagged material would not decrease its volume, nor would it provide any significant environmental benefit.

All characterization and disposal of the bagged Remedial Wastes was performed in accordance with the LCPCD, the 1996 SAP, the 1997 Second Modification of the LCPCD, and the Variance.

4.0 CHRONOLOGY OF EVENTS

The following chronology of events relevant to this Certification has been taken from existing documentation and then updated based on the disposal activities performed.

May 1985	USEPA issues first ROD for the Site which required removal and interim storage of dioxin-contaminated sewer and creek sediments.
October 1987	USEPA issues second ROD for the Site, which required on-Site thermal treatment of sewer and creek sediments and other remedial wastes.
Fall 1989	Buildings T-28 and T-29 are constructed and permitted.
September 1989	LCPCD entered in Federal Court.
1989-1993	Sediment, carbon, debris, and facility cleanup material are removed, dewatered, and bagged or placed into rolloffs. The remedial wastes and some rolloffs are subsequently transported to the Buffalo Avenue Plant for storage. A total of 15,496 bags were transported.
June 1990	USEPA establishes F039 waste code.
1993	Building U-91 is constructed and permitted.
June 1996	USEPA approves SAP for the characterization of Love Canal Remedial Wastes.
August 1996	Love Canal rolloff shipments begin.
November 1996	USEPA "Explanation of Significant Differences" issued.
November 1996	Phase I bagged waste sampling completed.

January 1997	Federal District Court modifies LCPCD.
May 1997	Phase I report submitted to USEPA.
September 1997	Love Canal rolloff shipments completed.
November 1997	OCC submits "Petition for Site Specific Treatability Variance" to USEPA.
February 1998	USEPA approves Phase I report.
February 1998	Shipment of Love Canal bagged remedial wastes for incineration begin.
April 1998	Phase II sampling completed.
June 1998	Phase II report submitted to USEPA.
August 1998	USEPA approves Phase II report.
September 1998	Shipments of Love Canal bagged remedial wastes for direct landfill disposal begin.
December 1998	USEPA approves the Variance petition.
December 1998	Bag storage facility Building T-29 certified as clean.
January 1999	Shipments of Love canal bags for direct landfill disposal under the Variance begin.
June 1999	Bag storage facility Building U-91 certified as clean.
August 1999	All bagged waste shipments completed.
October 1999	Bag storage facility Building T-28 certified as clean.
December 1999	All certificates of disposal for bagged waste and rolloff shipments are returned, audited for completion, and filed. One copy of the complete set is sent to USEPA.

5.0 CONSTRUCTION ACTIVITIES

Sewer sediments were excavated and bagged from 1986 to 1987. Creek sediments were excavated and bagged in 1989. The haul road material for roads installed during the creek excavation was treated and bagged in 1989, while the facility cleanup material was bagged in 1990. These are the materials that constitute the bagged waste materials.

The materials were dewatered, treated, and placed in double-lined bags. Materials too large for the bagging process were placed into rolloff boxes. All of the bags and some of the rolloffs were transported by truck from the Love Canal site to the Buffalo Avenue Plant. The rolloffs were stored on concrete pads in the T-Area of the Plant. The bags were stored in centralized storage facilities known as Buildings T-28 and T-29 in the T-Area of the Plant. The buildings were constructed and permitted in 1989, and are 90 feet by 400 feet. The superstructure of each building is composed of an aluminum frame with PVC coated fabric. Roof-top fans and sidewall louvers were included in each building for ventilation.

Each building has a reinforced concrete foundation consisting of a continuous wall 12 inches thick and 5 feet, 6 inches deep extending around the building perimeter. The floor is constructed of asphalt pavement on top of a 12-inch layer of run-of-crusher stone. An HDPE liner was placed under the stone to provide secondary containment. The floor is sloped toward the sidewalls, and concrete trenches with sumps are located along the sides of the buildings.

The bags remained in the buildings until disposal activities commenced in February 1998. A rail spur was constructed near the bag buildings in 1996. This rail spur was used to transport the bags from the Buffalo Avenue Plant to TSDFs via rail. Each rail car contained approximately 28 bags, which were loaded using Load-All forklifts and the straps on the bags. The rail cars were lined prior to use, and were tarped for shipment after the bags were loaded.

6.0 PERFORMANCE STANDARDS AND CONSTRUCTION QUALITY CONTROL

6.1 REMEDIAL WASTES CHARACTERIZATION AND DISPOSAL ACTIVITIES - ROLLOFFS

The rolloffs containing Love Canal Remedial Wastes were classified as F039 hazardous wastes. No further sampling was performed for the rolloffs. Rolloffs containing mainly debris were transported to Rollins/Laidlaw Subtitle C landfills in Utah (Grassy Mountain) and Colorado (Highway 36), where their contents were macro-encapsulated and landfilled. The waste debris was received at the facility in roll-off boxes and was inspected to insure it met the debris definition in the regulations. Once the material had been determined to meet the debris definition, it was approved for receipt and treatment at the facility. The waste was then scheduled for treatment by macro-encapsulation in one of the large treatment basins (40-100 yard size batches). The roll-off box was moved to the treatment basin and the entire contents of the roll-off were dumped into the basin. Cement kiln dust and/or Portland cement, lime, and water were added to the debris in sufficient quantity to encapsulate the debris material. The mixture was mixed using a back hoe to form a uniform mix. The mixture of cement, lime, water, and debris was then allowed to cure into a monolithic block. Once the block was cured and judged structurally solid it was placed in the landfill cell.

Rolloffs containing other materials were transported to Rollins/Laidlaw facilities in Texas (Deer Park) and Utah (Aragonite), where the contents were treated by incineration prior to landfill. A total of 76 rolloffs were shipped from August 19, 1996 to September 22, 1997; 66 for incineration and 10 for macro-encapsulation prior to landfill. Of the total, 21 rolloffs were shipped directly from the Love Canal Site. The remaining 55 rolloffs had been previously transported from Love Canal to the Buffalo Avenue Plant, and were shipped directly from the Plant.

All rolloffs were transported by highway using trucks supplied by Hazmat Environmental Group, Inc. of Buffalo, New York. All disposal facilities were approved

by USEPA prior to their use. The USEPA was provided with monthly letters that updated the progress of the Love Canal rolloff shipments.

A summary of the final disposition of all rolloffs is presented in Attachment 1.

6.2 WASTE CHARACTERIZATION AND DISPOSAL ACTIVITIES - BAGGED REMEDIAL WASTES

All Love Canal bagged remedial wastes were classified as F039 listed hazardous waste. The bagged waste materials were segregated into seven categories; creek sediment 1, sewer sediment, creek sediment 2, haul roads, creek debris, carbon, and facility cleanup materials. The creek sediment categories were labeled "1" and "2" to differentiate between material at the start of remediation and material at the Site closure. This was done in case the materials differed in the amount of organic materials present. It was originally estimated that 15,423 bags of material were stored in Buildings T-28 and T-29. Per the Second Modification of the LCPCD, OCC agreed to incinerate bags from the sewer sediment and carbon categories. The remaining five categories required characterization to determine if they might be directly landfilled or required treatment by incineration prior to disposal.

The June 3, 1996 SAP provided for the characterization of the bags in two phases. Phase I sampling and analysis was designed to provide the basic characterization data needed to determine the number of samples to be analyzed in Phase II, and the F039 regulated parameters that might exceed the LDR limits. Phase II sampling was designed to provide the data which would be used by OCC and the receiving TSDFs to determine which groups of bags required incineration, which groups of bags could be directly landfilled, and which groups of bags may be subject to the Variance to allow direct landfilling.

Phase I bag sampling began in November 1996 and concluded in December 1996. Phase I consisted of an initial comprehensive characterization of approximately one percent of the bagged materials, excluding the carbon and sewer sediment categories. The bags were separated into the remaining five categories. All bags were selected at random with sub-groups of 100 bags in each category. Each bag chosen was analyzed for the complete F039 LDR list of parameters.

The Phase I analytical data were validated in accordance with USEPA data validation guidelines. Overall, the data were evaluated and validated as acceptable. Some non-detect data were rejected due to poor analytical performance. The data that were rejected represented analytes that were not substances of concern at the Love Canal Site. The validation report was included in the Phase I Report as Appendix C.

The Phase I analytical results were evaluated statistically using SW-846 3rd Edition, Chapter 9 calculations. The Phase I results indicated that groups of bags in the creek sediment 1, creek sediment 2, haul roads, and facility cleanup categories were candidates for direct landfilling with the Variance. The creek debris category was substantially different from the other four categories in that the chemicals present were more diverse and generally higher in concentration. Based on the differences in analyte LDR exceedances and concentration levels, the creek debris category was excluded from the Phase II sampling or Variance and was incinerated. The Phase I data for the remaining four categories demonstrated that the concentrations of interest for Phase II sampling were fluoranthene, phenanthrene, lead, aldrin, BHCs, and dioxins/furans. The Phase I report presented the Phase I data and outlined the Phase II sampling. This report was submitted to USEPA on May 30, 1997, and was approved in February 1998.

Shipments of Love Canal bagged remedial wastes for incineration began in February 1998. Bags from the creek debris, carbon, and sewer sediment categories were shipped by rail from the Buffalo Avenue Plant to Laidlaw/Safety-Kleen incineration facilities in Deer Park, Texas and Aragonite, Utah. Each bag weighed approximately 2.5 tons, while each rail car contained approximately 27 bags. The bags were loaded into the lined cars and tarped prior to shipment. Shipments of bags from these categories continued during Phases I and II of the project.

Phase II sampling began in February 1998, and was completed in April 1998. The Phase II analytical results were used to characterize approximately 11,000 bags in the four categories. The Phase II results showed that none of the four categories qualified in its entirety for direct landfill disposal. Some groups of bags within each category could be directly landfilled, while other groups could be directly landfilled with the Variance. Some groups of bags required treatment (incineration) prior to disposal.

The Phase II analytical data were validated in accordance with USEPA data validation guidelines. All the data were evaluated and validated as acceptable with no exceptions. The validation report was included in the Phase II Report as Appendix C.

The Phase II report was submitted to the USEPA in June 1998. The USEPA approved the report in August 1998. The report specified the bags that could be directly landfilled without the Variance, and which bags would qualify based on the Variance. The anticipated disposal method for each of the four categories is presented in Attachment 2. Shipments of bags that qualified for direct landfill under the standard LDR limits began in September 1998. All bags shipped for direct landfilling were sent to the Laidlaw/Safety-Kleen Subtitle C Grassy Mountain landfill in Utah.

In December 1998, the USEPA approved OCC's petition for a treatability Variance. The Variance allowed OCC to directly landfill bagged wastes with F039 regulated dioxins/furans concentrations up to 10 micrograms per kilogram (µg/kg) (i.e., 10 times the standard LDR). Shipments of bags for direct landfill under the Variance began in January 1999. All shipments were sent to the Laidlaw/Safety-Kleen Grassy Mountain landfill in Utah. The last bags were shipped from Building T-28 on August 10, 1999. The incineration/disposal of the shipments was completed by October 30, 1999.

In summary, based on the modified LCPCD and the Phase I and Phase II reports, and using the final bags numbers at project completion, there were 15,496 Love Canal bags stored in Buildings T-28 and T-29. All bags from the carbon, sewer sediment, and creek debris categories were incinerated (4,525 bags). An additional 675 bags from the other four categories were incinerated based on the Phase I and II results. This number included two bags in the creek sediment category originally scheduled for stabilization. In addition, 34 bags were incinerated because the tags were lost and the bags could not be identified. The remaining 10,262 bags were directly landfilled either because they qualified based on the F039 LDRs or because they qualified based on the Variance.

6.3 LESSONS LEARNED

1. A project of this size and complexity with multiple transportation methods, multiple disposal outlets, and several companies involved required very close coordination and cooperation. During this project the loading of rail cars and bins was performed by plant personnel, supervision on-Site was by company staff and by the engineering firm involved in the project, transportation was by both truck and rail, and disposal included two incinerators and two landfills. It became clear early in the project that an issue with any one of these companies would have a dramatic impact on all the team members and that weather (winter in the Western New York area) was also a critical factor. Based on the early experience, a monthly project meeting with management from each company physically present was held in Niagara Falls, to discuss face to face the issue of the previous month and to plan the next month's activities. This meeting fostered a close working relationship among the vendors and the company, and provided a forum to solve problems quickly and keep the project moving forward. The lesson from this experience is that having close involvement by the management of all parties and meeting face to face is an important part of assuring that schedules are met and that all requirements of the Consent Order are successfully completed.

2. This project began in the late 1980s and spanned more than a 10-year period. As the shipping and disposal process began to be planned, there were several changes in the regulations and Consent Order that needed to be addressed. The disposal company and transportation company were brought on board and involved in the preplanning and change process. This allowed the modifications in the Order to be done once, to meet the requirements of the regulations and the Court, and also took into account the requirements for the disposal facilities and their permits. Involving the disposal companies and transportation companies early on in the process greatly expedited and simplified the planning phase. This resulted in virtually no change orders or modifications being required during the actual loading, shipping, and disposal phase of the project.

3. A database for tracking the individual bags for source, status, location, and final disposition would have aided in record keeping.

7.0 OPERATION AND MAINTENANCE ACTIVITIES

No operation and maintenance is required for this remedial action. The remedial action has been completed.

8.0 SUMMARY OF PROJECT COSTS

The selected remedy in the 1987 ROD estimated the following costs: Waste Handling/Pretreatment of $1.1M - $1.6M; and Thermal Treatment $11.3M - $15.8M. The selected remedy included on-site disposal. The total cost of OU-5, including pretreatment, bagging, transportation, storage and disposal, was approximately $20 million.

9.0 FINAL INSPECTION

A summary of the bags shipped for landfill and incineration for each category is presented in Attachment 3. A total of 5,234 bags were shipped for incineration prior to landfill disposal (3,151 bags to Deer Park, Texas, and 2,083 bags to Aragonite, Utah). A total of 10,262 bags were shipped for direct landfill disposal at the Grassy Mountain Landfill in Utah. The transportation manifests for the bags shipped were checked against the Certificates of Disposal (CDs) provided by the disposal facilities. The manifests and CDs were found to be in agreement. Therefore it was determined that all bags shipped had been properly disposed. Copies of all the manifests and CDs have been provided to USEPA, under separate cover December 16, 1999. The numbers differ slightly from the Phase II report projections because there were breaks in the bag numbering sequence. All bags located which required treatment prior to disposal (as specified in the LCPCD modification and Phase II report) were incinerated. All centralized storage facilities used to house the Love Canal bagged wastes have been high pressure washed and certified as clean in accordance with the appropriate RCRA specifications and the requirements for such facilities and the associated permits.

The last bags were shipped from Building T-28 on August 10, 1999. Mr. Robert Simmington of Occidental Chemical Corporation and Mr. Elmer Krupp of Miller Springs Remediation Management, Inc., an affiliate of OCC, were in attendance the day the last bags were shipped off-Site for disposal and the bag storage facilities were deemed empty. This completed the shipments of bags for off-Site disposal to the appropriate final disposal sites. The inspection was conducted in conjunction with USEPA requirements. Since the facilities (T-28 and T-29) used for storage of the specified bagged materials are subject to OCC's RCRA permit, it was not mandatory that a USEPA representative be present at the time of inspection. The transport, treatment and ultimate disposal of the Remedial Wastes were also implemented in accordance with USEPA RCRA requirements.

10.0 CERTIFICATION OF COMPLETION

This is to certify that OCC has completed OU-5 – the proper disposal of all Love Canal remedial waste materials – in accordance with the LCPCD, including the 1997 Second Modification of the LCPCD, the June 1996 SAP, and the Variance. All requirements of the above referenced documents have been met. No operations and maintenance are applicable to this operable unit; the actions documented herein have resulted in the ultimate disposal of all Love Canal remedial wastes.

Donald W. McLeod, P.E.

March 29, 2000

Date

ATTACHMENT 1

DISPOSAL SUMMARY - LOVE CANAL ROLLOFFS

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OCCIDENTAL CHEMICAL CORPORATION
NIAGARA FALLS, NEW YORK

Rolloff #	*Box ID*	*Date Shipped From Love Canal to Plant*	*Disposal Disposition*	*Rollins/Laidlaw TSDF Location*	*Date Shipped To TSDF*
1	RB-31	10/25/89	Incineration	Texas	09/22/97
2	RB-21	10/26/89	Landfill	Grassy Mountain, Utah	09/11/97
3	RB-20	10/26/89	Incineration	Texas	07/29/97
4	RB-29	10/27/89	Incineration	Texas	07/14/97
5	RB-25	10/27/89	Incineration	Texas	07/28/97
6	RB-22	10/30/89	Incineration	Texas	09/22/97
7	RB-28	10/30/89	Incineration	Texas	07/14/97
8	RB-24	10/30/89	Incineration	Texas	07/14/97
9	RB-23	10/30/89	Incineration	Texas	07/29/97
10	RB-30	10/31/89	Incineration	Texas	07/29/97
11	RB-26	10/31/89	Incineration	Texas	07/28/97
12	RB-27	11/01/89	Incineration	Texas	07/28/97
13	RB-5	11/03/89	Incineration	Utah	07/23/97
14	RB-14	11/03/89	Incineration	Utah	05/09/97
15	RB-81	11/03/89	Incineration	Utah	06/19/97
16	RB-131	11/03/89	Incineration	Utah	05/09/97
17	RB-12	11/06/89	Incineration	Utah	07/03/97
18	RB-10	11/06/89	Incineration	Utah	07/03/97
19	RB-2	11/06/89	Incineration	Utah	06/19/97
20	RB-9	11/06/89	Incineration	Utah	07/25/97
21	RB-4	11/07/89	Incineration	Utah	07/25/97
22	RB-01	11/07/89	Incineration	Utah	06/19/97
23	RB-7	11/07/89	Incineration	Utah	06/18/97
24	RB-6	11/08/89	Incineration	Utah	06/19/97
25	RB-3	11/08/89	Incineration	Utah	07/03/97
26	RB-8	11/08/89	Incineration	Utah	06/18/97
27	RB-30	11/15/89	Incineration	Utah	09/22/97
28	RB-31	11/15/89	Incineration	Utah	09/03/97
29	RB-33	11/17/89	Landfill	Colorado	02/06/97
30	RB-34	11/17/89	Landfill	Colorado	02/24/97

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Rolloff #	*Box ID*	*Date Shipped From Love Canal to Plant*	*Disposal Disposition*	*Rollins/Laidlaw TSDF Location*	*Date Shipped To TSDF*
31	RB-72	11/27/89	Incineration	Utah	09/03/97
32	RB-54	11/28/89	Incineration	Utah	09/03/97
33	RB-55	11/28/89	Incineration	Utah	09/22/97
34	RB-50	12/14/89	Landfill	Colorado	02/21/97
37	-	08/06/90	Landfill	Colorado	02/24/97
38	RB-81	08/08/90	Landfill	Grassy Mountain, Utah	09/11/97
39	RB-82	08/08/90	Landfill	Colorado	02/21/97
40	RB-83	08/14/90	Landfill	Colorado	03/20/97
41	RB-07	10/09/90	Incineration	Utah	09/03/97
62	-	03/11/93	Incineration	Utah	02/07/97
63	-	03/11/93	Incineration	Utah	02/06/97
64	-	03/11/93	Landfill	Grassy Mountain, Utah	09/11/97
65	-	03/11/93	Incineration	Utah	10/31/96
66	-	03/11/93	Incineration	Utah	11/06/96
67	-	03/11/93	Incineration	Utah	10/31/96
68	-	03/11/93	Incineration	Utah	02/07/97
69	-	03/11/93	Incineration	Utah	09/10/96
70	-	03/12/93	Incineration	Utah	11/07/96
71	-	03/12/93	Incineration	Utah	02/05/97
72	-	03/12/93	Incineration	Utah	02/07/97
OR-7 (1)	Rolloffs 70 & 66	-	Incineration	Utah	11/05/96
OR-5A (1)	Rolloffs 32 & 41	-	Incineration	Utah	09/03/97
OR-21 (1)	Rolloffs 28 (Debris) & 64	-	Landfill	Grassy Mountain, Utah	09/11/97
R25335RT (1)	Rolloff 31	-	Incineration	Utah	09/03/97
R3222RT (1)	Rolloffs 1& 27	-	Incineration	Utah	09/22/97
OR-5	-	*	Incineration	Utah	08/19/96
OR-4	-	*	Incineration	Utah	08/19/96
OR-49	-	*	Incineration	Utah	08/19/96
OR-7	-	*	Incineration	Utah	08/20/96
OR-8 (2)	-	*	Incineration	Utah	08/20/96

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Rolloff #	*Box ID*	*Date Shipped From Love Canal to Plant*	*Disposal Disposition*	*Rollins/Laidlaw TSDF Location*	*Date Shipped To TSDF*
OR-6	-	*	Incineration	Utah	08/20/96
OR-12	-	*	Incineration	Utah	08/21/96
OR-10	-	*	Incineration	Utah	08/21/96
OR-11	-	*	Incineration	Utah	08/21/96
OR-9	-	*	Incineration	Utah	08/21/96
OR-16	-	*	Incineration	Utah	08/23/96
OR-15	-	*	Incineration	Utah	08/23/96
OR-13	-	*	Incineration	Utah	08/23/96
OR-14	-	*	Incineration	Utah	08/23/96
OR-46	-	*	Incineration	Utah	08/26/96
OR-17	-	*	Incineration	Utah	08/26/96
NA	-	*	Incineration	Utah	08/27/96
NA	-	*	Incineration	Utah	08/27/96
NA	-	*	Incineration	Utah	08/28/96
RB-41	-	*	Incineration	Utah	08/28/96
NA	-	*	Incineration	Utah	08/29/96

Notes:

(1) Rolloff generated at the Plant; consists of material transloaded from overweight rolloff boxes (see Box ID).

(2) Rolloff contained large debris which was removed at Rollins' Utah facility and trans-shipped to Rollins' Colorado facility on 01/13/97 for landfill disposal.

* Rolloff shipped directly from Love Canal to Rollins' Utah facility.

NA Not available - no identification designated.

ATTACHMENT 2

FINAL BAG DISPOSITION
CREEK SEDIMENT 1, CREEK SEDIMENT 2, HAUL ROADS, AND
FACILITY CLEANUP CATEGORIES - PHASE II REPORT

FINAL BAG DISPOSITION - CREEK SEDIMENT 1 (1)
LOVE CANAL BAGGED WASTES
PHASE II REPORT
OCCIDENTAL CHEMICAL CORPORATION
NIAGARA FALLS, NEW YORK

Bag Number	*Stabilization*	*Landfill*	*Landfill with Variance*	*Incineration*
1-630		X		
631			X	
632-723		X		
724-800			X	
801-1000				X
1001-1447			X	
1448-2784			X	
2785		X		
2786-2867			X	
2868		X		
2869-3253			X	
3254				X
3255-3525			X	
3526		X		
3527-3619			X	
3620-3692		X		
3693			X	
3694-3736		X		
3737			X	
3738-4071		X		
4072			X	
4073-4168		X		
4169			X	
4170-4221		X		
4222			X	
4223-4835		X		
4836			X	
4837-5067		X		
5068-5086			X	
5087		X		
5088-5182			X	
5183		X		
5184-5260			X	
5261		X		
5262-6144			X	
6145	X		X	
6146-6470			X	
6471	X	X		
6472-6669			X	
6670		X		
6671-6721			X	
6722		X		

FINAL BAG DISPOSITION - CREEK SEDIMENT 1 (1)
LOVE CANAL BAGGED WASTES
PHASE II REPORT
OCCIDENTAL CHEMICAL CORPORATION
NIAGARA FALLS, NEW YORK

Bag Number	*Stabilization*	*Landfill*	*Landfill with Variance*	*Incineration*
6723-6800			X	
6801		X		
6802-6909			X	
6910		X		
6911-7077			X	
7078		X		
7079-7108			X	
7109		X		
7110-7232			X	

Notes:

(1) In accordance with the approved SAP and Phase I report, the disposal of bags sampled in Phase I was based solely on the individual Phase I bag data, not on its Phase II bag grouping. If a Phase I bag's disposal characterization agreed with its Phase II bag grouping, it was included in the grouping. If a Phase I bag's disposal characterization differed from its Phase II bag grouping, it is listed on the table individually.

FINAL BAG DISPOSITION - CREEK SEDIMENT 2 (1)
LOVE CANAL BAGGED WASTES
PHASE II REPORT
OCCIDENTAL CHEMICAL CORPORATION
NIAGARA FALLS, NEW YORK

Bag Number	*Stabilization*	*Landfill*	*Landfill with Variance*	*Incineration*
7984		X		
7985			X	
7986-8010		X		
8011			X	
8012-8220		X		
8221			X	
8222-8337		X		
8338				X
8339-8362		X		
8363-8431			X	
8432		X		
8433-8528			X	
8529		X		
8530-8601			X	
8602		X		
8603-8741			X	
8742-9495		X		

Notes:

(1) In accordance with the approved SAP and Phase I report, the disposal of bags sampled in Phase I was based solely on the individual Phase I bag data, not on its Phase II bag grouping. If a Phase I bag's disposal characterization agreed with its Phase II bag grouping, it was included in the grouping. If a Phase I bag's disposal characterization differed from its Phase II bag grouping, it is listed on the table individually.

FINAL BAG DISPOSITION - HAUL ROADS (1)
LOVE CANAL BAGGED WASTES
PHASE II REPORT
OCCIDENTAL CHEMICAL CORPORATION
NIAGARA FALLS, NEW YORK

Bag Number	*Stabilization*	*Landfill*	*Landfill with Variance*	*Incineration*
9496-9599		X		
9600-9669			X	
9670				X
9671-9704			X	
9705				X
9706-9837			X	
9838		X		
9839-9903			X	
9904		X		
9905-10015			X	
10016-10224		X		
10225-10240			X	
10241				X
10242-10391			X	
10392		X		
10393-10424			X	
10425		X		
10426-10534			X	
10535				X
10536-10711			X	
10712		X		
10713-10945			X	

Notes:

(1) In accordance with the approved SAP and Phase I report, the disposal of bags sampled in Phase I was based solely on the individual Phase I bag data, not on its Phase II bag grouping. If a Phase I bag's disposal characterization agreed with its Phase II bag grouping, it was included in the grouping. If a Phase I bag's disposal characterization differed from its Phase II bag grouping, it is listed on the table individually.

FINAL BAG DISPOSITION - FACILITY CLEANUP (1)
LOVE CANAL BAGGED WASTES
PHASE II REPORT
OCCIDENTAL CHEMICAL CORPORATION
NIAGARA FALLS, NEW YORK

Bag Number	*Stabilization*	*Landfill*	*Landfill with Variance*	*Incineration*
14817-14857			X	
14858		X		
14859-14903			X	
14904-14946		X		
14947-14948			X	
14949		X		
14950-14989			X	
14990-15032			No Sample	
15033-15277			X	
15278				X
15279-15290			X	
15291-15774				X

Notes:

(1) In accordance with the approved SAP and Phase I report, the disposal of bags sampled in Phase I was based solely on the individual Phase I bag data, not on its Phase II bag grouping. If a Phase I bag's disposal characterization agreed with its Phase II bag grouping, it was included in the grouping. If a Phase I bag's disposal characterization differed from its Phase II bag grouping, it is listed on the table individually.

ATTACHMENT 3

FINAL DISPOSAL SUMMARY - LOVE CANAL BAGGED WASTES

FINAL DISPOSAL SUMMARY - LOVE CANAL BAGGED WASTES
OCCIDENTAL CHEMICAL CORPORATION
NIAGARA FALLS, NEW YORK
FINAL DISPOSITION AT PROJECT COMPLETION (AUGUST 10, 1999)

Bag Category	*Total Number of Bags (1)*	*Number of Bags Shipped (Landfill)*	*Number of Bags Shipped (Incineration)*
Sewer Sediment	751	0	751
Creek Debris	3714	0	3714
Carbon	60	0	60
Creek Sediment 1	7217	7007	210
Creek Sediment 2	1509	1508	1
Haul Roads	1449	1442	7
Facility Cleanup	762	305	457
Unknown (2)	34	0	34
Totals	15496	10262	5234 (3)

Notes:

(1) Total number of bags identified for shipping during program.

(2) Consists of bags from other categories that no longer have tags. These bags could not be identified and were incinerated.

(3) A total of 3151 bags were transported to Deer Park, Texas. A total of 2083 bags were transported to Aragonite, Utah.